

Hydrogen A-Train Waste Heat Boiler Piping CUI



IMPACT ERM:

Loss# 23903 Inv# 14246

Location:

Hydroprocessing – South
Isomax – Hydrogen A-Train
(H2-A)

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Photo of Thin Pipe:



CUI on H2A Waste Heat Boiler
Intermittent Blow down piping

Incident Description:

On 10/14/2011, the Corrosion Under Insulation (CUI) project group stripped the insulation from the intermittent blow down piping for the Hydrogen A Train Waste Heat Boilers (WHBs). Upon stripping of the piping, severe corrosion was found, and as a result, the piping had only a remaining wall thickness of 0.020". Access to the area was restricted and the unit was shut down to replace this corroded piping and other similar corrosion damaged areas.

Investigation Findings:

- 1) The intermittent blow down piping is stagnant until it becomes used at which time its temperature increases to 450F. It is used twice each day. Moisture condenses on the outside of the pipe surface as it cools under the insulation and then is boiled off when it heats up. These conditions are ideal for CUI damage.
- 2) A work order was entered in 2007 to replace the H2-A intermittent blow down piping, remove its insulation, and install personnel protection guards. Although the piping was replaced, the insulation was incorrectly re-installed, and the protective guard screens were not added.

Lessons Learned:

- 1) For lines that are insulated to prevent burn injuries, personnel protection guard screens may be more appropriate than insulation.
- 2) Upon detecting severe CUI, the inspector should do an LPSA prior to removing any scale.

What Worked Well:

- 1) Operators reduced worker exposure to a potential failure by restricting the area where the CUI damage was discovered.
- 2) All the right people were involved to review feasible options prior to shutting down the H2-A unit.

Recommendations:

- 1) Inspectors should review the need for insulation on boiler intermittent blow down lines.
- 2) Work order job plans resulting from an inspection recommendation should include a "hold step" to verify the work performed is correct.
- 3) Replace similar insulation on intermittent blow down piping at H2-B Train with protective guard screens.

Tenets of Operations Violated:

- 6) Always maintain integrity of dedicated systems
- 7) Always comply with all applicable rules and regulations
- 10) Always involve the right people in decision that affect procedures and equipment.

***IIF – Every Task,
The Right Way,
Every Time***